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Administrative behavior in implementing educational innovations is defined in terms of selecting, installing, evaluating, extending, and improving innovations in the administrator's system. It is suggested that on the basis of relevant facts, knowledge of alternative procedures, and careful plans, an administrator can select an educational innovation promising the most substantial improvements in areas of greatest student needs. The key to installing an innovation is advanced planning coupled with active participation of all individuals who will be involved Successful improvement of innovations requires evaluation of types of instructional methods and materials so that broad knowledge about why one program is better than another is obtained. (TT)

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ADMINISTRATIVE BEHAVIOR IN IMPLEMENTING EDUCATIONAL INNOVATIONS*

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It is rapidly becoming clear to all educational administrators that American education must change. Substitution of world concerns for local concerns in even the smallest communities, the knowledge explosion, the recognition of the need for educational experiences suitable for each of our young people, the need to make effective use of increasing leisure hours, and the requirements and opportunities of the new technologies indicate that sweeping changes must be made in American education. The complexity and urgency of society's needs demand more than the minor changes which would make it possible to do better what is now being done. It is essential that the fundamental quality of American education and its effectiveness in meeting the needs of each of its students be greatly improved.

Too often in the past educational innovations adopted by administrators in good faith have turned out to be ineffective changes representing fads rather than sound educational improvements. The educational profession has become wary of these fads and is developing a new sophistication. Many administrators are now studying proposed innovations critically and systematically in terms of their costs and their benefits to the students. The educational administrator must make the important decisions essential for improvement in his school or district. Unfortunately, very few of the educational innovations being proposed for the schools are now accompanied by the types of evaluative information which provide the basis for a sound and confident judgment by an administrator.

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This dilemma is the reason for the present discussion. There are at least five suggestions which focus on aspects of administrative behavior in implementing educational innovations. These are selecting, installing, evaluating, extending, and improving educational innovations in the administrator's system.

SELECTING EDUCATIONAL INNOVATIONS

The most important behavior for an administrator is decision-making in choosing which educational innovations are to be tried out and evaluated in his system. No amount of sophistication and effort with respect to the other four types of administrative behavior can compensate for poor decisions in selecting innovations for tryout. The last three decades have seen important contributions by mathematical statisticians to the art and science of decision-making. Through the work of R. A. Fisher, J. Neyman, E. Pearson, and Abraham Wald a sophisticated decision theory has been developed. More recently, operations analysts have constructed procedures based on these concepts which apply comprehensive analyses of costs and related benefits to a wide variety of practical operational problems. Similarly, systems engineers have developed an approach to the problem of improving bases for decisions which they call systems analysis.

Common elements in all of these approaches to better decisions are: (1) a clear definition of objectives of the system in terms of output or products; (2) a comprehensive description of the total situation, including all conditions which might affect costs and benefits resulting from the possible decisions which might be made; and (3) a detailed description of fixed inputs. In education these fixed inputs consist primarily of the characteristics of students, but in many local situations a number of other factors are fixed, such as existing teaching staff and facilities. A basic problem, whether it is called decision theory, operations analysis, systems

analysis, or planning-programming-budgeting (PPB) which is the federal government designation, is to identify and make systematic comparisons between alternative methods proposed for meeting the objectives of a program.

Unfortunately an educational administrator rarely has the type of solid data which enables him to reach a definitive solution by comparing costs and benefits of various alternatives. He also has limited funds with which to make those special studies which might provide basic data for a decision. However, these short-comings should not prevent his approaching a problem in a systematic way and coming to a decision as sophisticated as the data available and his resources will permit.

His first step should be to make a comprehensive study of fixed inputs and the desired outputs of his system. What are the characteristics of students served by his school or district? What education will be of most value in preparing these students for their future roles and activities? It is likely that most errors by administrators in making decisions about educational innovations occur because of inadequate study of available data concerning the children entering his system and inadequate information concerning the requirements for preparing them for effective participation in suitable roles and activities after leaving his system. In a study of both inputs and outputs nothing is so detrimental to obtaining a sound basis for administrative decisions as the use of averages. Also descriptions of "typical students" and statements of desirable outcomes in terms of a "hypothetical representative type" are misleading oversimplifications. Needed instead is a careful examination of the full range of talents and the variety of patterns of aptitudes and characteristics exhibited by incoming students. Similarly, it is necessary to understand the great variety of roles and activities that all these individual students will participate in after they leave school. It is essential that future decisions be made for the total range of educational objectives and not for either the college preparatory student or the "average" student.

When an administrator has a clear picture of inputs and outputs for his system, he can turn to the study of possible innovations which might improve the quality of the output. In doing so, he must weigh the costs of each proposed modification in his system compared with potential benefits. Each alternative must be evaluated in terms of available data. However, a few guidelines may be of assistance. First, those reviewing recent educational research have been impressed with the fact that in many experimental studies, variations in media, reorganization of material, and innovative methods have produced either no differences at all or relatively trivial differences in achievement in groups of carefully matched students. Programmed learning, teaching machines, educational television, and similar variations in learning methods and materials have, on the basis of experimental evaluation, been found to do specific instructional tasks about as well as or only slightly better than more conventional procedures. An administrator will be well advised to ignore claims that some one approach is the educational innovation which will meet his problems. Educational technologists advocating a broad range of procedures are rapidly taking the place of the enthusiasts for a single method to serve as a panacea. The search now centers on identifying which educational objectives can be most effectively taught by which available instructional media.

For an administrator in search of educational innovations returning large benefits in relation to their costs, substantial opportunities for improvement are offered by situations in which it has been found that students are wasting a large portion of their time. Project TALENT and other studies have made it abundantly clear that there are many students in our schools who are either required to waste time on materials they are already familiar with or are forced to waste time using books from which they cannot possibly learn because of their inability to read and understand the contents. For example, in the Project TALENT Survey, 34% of both twelfth grade boys and twelfth grade girls reported that about half the time or more frequently they "read material over and over again without really understanding what they had read."

Another opportunity for substantial improvement can be realized by establishing appropriate objectives for each student rather than adopting a uniform set of goals for all. If the limited school-time is to be of most value to each student, great care should be taken to determine which abilities and knowledge will be of most value to him in his subsequent roles and activities.

Another promising area for productive innovation with substantial benefits at small cost is a code of revised procedures which supply a student with motivation for his learning tasks. It cannot be expected that educational procedures will be effective if a student does not wish to learn. Recent studies show that for most students there is a substantial drop in eagerness to learn typical school content between the time they enter school in the first grade and the time they graduate from high school in the twelfth grade. Project TALENT results indicate that 53% of twelfth grade boys and 37% of twelfth grade girls checked the statement that about half the time or more frequently, "lack of interest in my school work makes it difficult for me to keep my attention on what I am doing."

Project TALENT results indicate that the average grade nine student, when given a list of 24 new words to be associated with familiar words, is able to learn the meaning of 10.4 words in four minutes or about two and a half words a minute. The average grade twelve student does a little better than the average grade nine student with 12.3 words correct after four minutes study, or about three words per minute. It is important to note here however, that differences between grade nine students and grade twelve students are very small in relation to the differences within either of these grades. For example, about 10% of ninth graders learn only one word a minute in the four minute period and another 10% of ninth graders learn more than four words a minute. Nearly a third of the ninth graders are able to learn these new words more rapidly than the average twelfth grade student.

Further to illustrate the very important differences found in students within the same grade and to point the need for treating such students in accordance with their abilities rather than on the basis of grade placement, the results in reading comprehension will be cited. The comparative ability of various students to read and understand verbal materials becomes meaningful when Project TALENT results are interpreted in terms of students' ability to comprehend the writings of ten standard literary authors as well as the contents of ten popular American magazines. Using a score of 50% of the items correct for a particular author as a criterion of reasonable understanding of the writing of that author, it was reported that 42% of ninth grade students and 72% of twelfth grade students indicated at least this level of understanding of the writings of Robert Louis Stevenson. For sample articles from the Reader's Digest, the corresponding figures were 18% for grade nine students and 45% for grade twelve students. Using sample paragraphs from the Saturday Review, only about 1% of grade nine students and about 4% of grade twelve students achieved what might be considered an acceptable degree of understanding. These findings again illustrate the very considerable individual differences within grades. They also raise serious questions about the adequacy of current instruction in such a basic skill as reading comprehension.

The above findings lead to still another suggestion for the administrator. This is to look for a type of innovation which focuses on important broad goals of education such as problem solving, learning how to learn, learning to take responsibility, learning to plan, and learning to manage one's own developmental program.

Another set of findings from Project TALENT which may indicate an area in which improvement is needed is based on a group of students tested in grade nine in 1960 and retested in grade twelve three years later. In tests of four basic skills including creativity, arithmetic reasoning, abstract reasoning, and visualization in three dimensions, boys showed

definitely larger gains than girls. On the other hand, girls showed greater gains than boys in memory for words. A reasonable explanation of these findings is that differences in gains are due to differences in courses taken by the typical boy and the typical girl in the last three years of secondary school. If these basic abilities are judged to be important for a particular student, it appears plausible that taking courses included in present offerings can increase performance in the four basic skills. It also seems likely that it is possible to modify the content of some existing courses to focus more directly on certain of these basic abilities to the substantial benefit of a number of students.

One final set of findings from Project TALENT which may suggest an area in which an administrator might study the need for improvement in his local school program, relates to the stability of career plans of secondary school students. Only 19% of boys who indicated their career plans in grade ten and again three years later and 31% of grade twelve boys who indicated their plans in grade twelve and again one year later, were still planning the same career. About 45% of grade ten boys and 41% of grade twelve boys were planning professional careers. One year after graduation from high school these figures had dropped to 27% and 32% respectively. Although the proportion of the population in the professional occupations is increasing, it is obvious that career plans of boys in high school are far from realistic.

A final point for this section on appropriate administrative behavior in selecting educational innovations is that this selection is a definite responsibility of the administrator. It is of course desirable to consult with other administrators, the staff, and experts of many types including educational researchers. However, collecting the necessary data to make a sound decision, and this decision itself, must be the full responsibility of the administrator himself.

INSTALLING EDUCATIONAL INNOVATIONS

The administrator must make a systematic survey of the problems of installing an educational innovation as an important part of the data

collection and analysis used as a basis for the final selection decision. This means discussions with staff, parents, and pupils concerning the implications of participation in the innovative program. By discussing purposes and expected outcomes of the program with these groups, the administrator will gain both valuable data about the feasibility and probable outcomes of the innovative procedures and also information regarding the scope and timing of the introduction of the innovative program. Since, at the present time, most innovative programs being considered by an administrator have not been adequately evaluated, they will usually be introduced to a relatively small group of students using volunteer teachers who also have the approval of the parents concerned. Although it is suggested that the initial group be small, it should not be so small that it is impossible to obtain an adequate evaluation of its effectiveness. The appropriate orientation of teachers is crucial to implementing any innovative program. This usually should include a specific training program focused on necessary new skills and sufficiently realistic and extensive to give them confidence in their ability to perform their new role effectively.

It is also important that an administrator present an innovative program to his superiors whether they be a board of education or a central staff. This presentation should include his analysis of the existing situation, alternatives considered, and other reasons for his recommendation. He should list both anticipated outcomes of the program and estimated costs over the next several year period if the program is successful and is extended to other units of the school system.

When installing a new program it is important that comprehensive advance planning be carried out. This should include the development of contingency procedures for use if specific aspects of the program are found to be unsatisfactory. A very important and frequently neglected aspect of installing an innovative program is in-service supervision and monitoring of the program. It is necessary that someone have a definite responsibility for checking to see that the innovative program is installed and planned, that

unforeseen problems are resolved in a manner which is compatible with the concepts and purposes of the program, and that communication failures do not prevent the program's functioning in the manner intended.

One of the most difficult aspects of installing educational innovations from the point of view of the administrator is in readjusting his own frame of reference so that he reinforces the specific types of behaviors of teachers which are effective in the new situation. It is essential that the administrator take the necessary time to learn what is happening with respect to the students' achievement and personal development. An innovative classroom is sometimes perceived as an ineffective one if judged by the standards of the traditional type of teaching. If students are active, moving about the room, talking with each other, and operating audiovisual equipment with little supervision from the teacher and administrator, a person unfamiliar with the nature of an innovative program might too quickly conclude that the teacher was a poor disciplinarian and that little learning was going on. It is therefore important that the administrator examine the classroom situation closely to determine whether the student activities are in fact productive learning activities rather than disruptive and recreational behaviors. Students and teachers should be rewarded by an administrator for productive learning activities and not for docility.

EVALUATING EDUCATIONAL INNOVATIONS

The most neglected aspect of programs for educational innovation in American education has been the evaluation procedures. The more comprehensive and rigorous the procedures used by an administrator in making a decision to try out an educational innovation, the easier it will be to develop the evaluation aspects of the program. In education the principal outcomes of innovative programs should be increased student learning, desirable student behavior, and increased student development of various skills and appreciations.

The basis for evaluation in a program of educational innovation is very similar to the basis for valid decision-making discussed under "Selecting

Educational Innovations." For adequate evaluation, there must be not only a clear definition of the objectives of the system in terms of outputs or products, but also practical measures for assessing the extent to which these objectives have been achieved. A common error in program evaluation is the use of partial and inadequate criteria for measurement. It is important to measure all the results of an innovative program. Unplanned effects which may include negative attitudes or other types of deficiencies negating positive contributions of the program should be identified and studied.

For a valid evaluation, it is also necessary to have detailed descriptions of student characteristics, in addition to each factor as teachers and materials, time spent, and other matters relevant to the achievement of objectives. In most studies of educational innovation it is profitable to compare the performance of experimental groups with the performance of comparable control groups using conventional procedures.

Any sample of students used for evaluation should be sufficiently large so that sampling errors will not mask the results. However, if the results are so small that they can be clearly seen only with a very large sample, it is unlikely they will have great practical significance. To obtain an adequate evaluation of an innovative program, it is important to include a detailed and accurate description of the total learning situation and instructional activities of the innovative group. On the basis of costs it can be determined in advance how large a difference in achievement will be required to justify the use of the new program. A sample size can be evolved on the basis of this estimate.

It is very important that an evaluation not be confined to such easily measured aspects of achievement as the acquisition of facts. It is important that various aspects of behavior be evaluated, even though in most instances the evaluation must be based on observational records of student behavior or subjective estimates of student attitudes. Even small samples of student behavior recorded by a teacher are more useful than subjective evaluations by outside experts who are brought in to the classroom at the close of a study and asked to evaluate the program by talking to teachers and students.

As indicated earlier, one of the most important aspects of evaluation is that it relate to educational objectives and goals appropriate for an individual student. Averages of achievement scores conceal much in the way of inappropriate and poorly planned educational development. The total evaluation of an innovative program should concentrate on the desired developmental program for each student in terms of his own pattern of potentials. Achievement in certain areas may have only trivial value for certain students, but be very important to others. Individual educational objectives must be stated in operational terms and the relative importance of each made explicit if a valid evaluation of an innovative program is to be made.

One more aspect of evaluation frequently neglected is the long-range follow-up. Many objectives of an educational program are aimed at subsequent use of skills, information, and abilities, as well as projected adult roles. To obtain an adequate evaluation it is important to find out not only that required skills, knowledge, and abilities were achieved, but also that individual students did in fact make use of their achievements in later roles and activities.

To illustrate some of the types of evaluation essential to determining the effectiveness of an innovative educational program, some of the procedures used in an evaluation of the Hicksville Public Schools in 1965-66 are presented. A basic type of evaluation included in this study was the comparison of test scores of a representative sample of students in selected grades with test results on the same or similar tests from schools serving districts having the same socioeconomic characteristics as the district being studied. Although available tests standardized on state and national samples do not cover all of the important objectives of education, they do cover a large number of very important aspects of elementary and secondary school programs.

To supplement these data, a questionnaire study was made by the Hicksville Public Schools from samples of students in various grades, and

this was followed by individual interviews with each of these students. Prior to each interview the evaluator studied carefully the student's cumulative record, his results on achievement tests and other standardized tests, and his responses to the questionnaire. The student's activities were discussed with teachers and specialists on the basis of the results of this study. On the basis of all the findings, the evaluator provided estimates of several aspects of the school program as it related to the individual student. These included "how well is the school meeting the student's needs," "what is the quality of student motivation for learning," "what specific problems does the student have which the school could help to correct." Although such evaluations are quite subjective in character, a second evaluator (used in about 20% of the same cases) was found to be in substantial agreement with the initial evaluator. The investigators' reports of specific cases appear to provide compelling evidence to substantiate their evaluations.

One more type of evaluative information obtained from this study was based on follow-up studies of the graduating classes of 1960 and 1964. Responding to reminders and further follow-ups over a period of six weeks, 84% of 753 members of the class of 1964 and 72% of 429 graduates of the class of 1960 completed and returned their questionnaires. They were asked a number of questions about their experiences in school and since leaving school. These included queries as to the adequacy of their preparation for later school or work, specific decisions made that they subsequently regretted, problems they had encountered in adjusting to new situations, and matters with which the schools might have assisted them to a greater extent. Nearly half the graduates of the class of 1960, for example, indicated things that they wished had been more helpful to them. These were "counseling and special services," "instruction in how to study," and "information relating their aptitudes and abilities to careers." They were also asked what things their school had done which were especially helpful in their later activities.

The principal point of this discussion regarding evaluation is the importance of focusing attention on the individual student. Too much educational evaluation in the past has been focused on the teacher and other aspects of the process of education rather than on the product of education which is obviously the student.

EXTENDING EDUCATIONAL INNOVATIONS

A well planned program of evaluation includes decision points at which the analysis of appropriate data will indicate whether to continue the innovative program or to discontinue it. The weakness of many innovative programs is that they do not have previously planned decision points for continuation and in some instances programs gradually disappear without any explicit decision being made to continue or not to continue them. Just as important as the decision to discontinue an innovative program is the decision to extend it to other groups as part of the installation plan. There should be points scheduled at which the program will be extended if results from evaluative studies justify this. In most innovative programs it is desirable that this extension be gradual, but it must not be so slow as to fail to utilize fully a procedure which has been clearly demonstrated to be an improvement over existing programs.

Although all of the points discussed under installing and evaluating a program apply also to extending the program, the point which usually needs the greatest attention in the extension of any program is the problem of obtaining money for the additional costs. The rules for studying budgeting and additional costs are again similar to those discussed under previous decision-making problems. The total educational program needs to be examined and each expenditure studied in terms of cost-effectiveness. Here again final decisions must be based on a systematic analysis of the important outcomes of the total system and consideration of the cost-effectiveness values of all alternatives. If planning and decision-making in previous phases of the program have been adequate, its extension within the system will occur as a natural consequence of the evaluation findings.

IMPROVING EDUCATIONAL INNOVATIONS

The principal distinction between a modern approach to education and a traditional one is best illuminated by the contrast between verified knowledge about effective instructional methods and materials and understanding the personal skill and effort of a devoted, inspirational, and experienced teacher. There is a rational basis for modern efforts to improve education for all students. It is simply the need for society to learn from experience in a systematic and replicable way and the desire to provide to all students the advantages gained by the few who have been fortunate enough to study under the best teachers. In implementing any educational innovation it is essential to plan for continuous improvement in the innovative program. It is desirable that the development and evaluation of the educational innovation be as sophisticated as possible with respect to its design. It is certainly useful to know that one set of instructional materials is more effective with students than another set. For continuous improvement it is very important to know as surely as possible why some materials are better and with what types of students they are better. This requires innovative programs to be built in such a way as to test any specific hypothesis. We should be able to prove that one class of methods or materials having specified psychological impacts is more effective than another class. It is this type of study which will provide education with the "building-block" knowledge typical of the scientific approach rather than simply the information that in one specific set of circumstances procedure A was more productive than procedure B.

Finally, it is important to emphasize that providing a teacher with more efficient tools and better instructions about how to use them will dehumanize neither the teacher nor the instructional process, but merely make instruction more effective and appropriate.

SUMMARY

Administrative behaviors implementing educational innovations have been discussed under five main headings. The theme running throughout may be summarized as follows: Collect all the relevant facts, study possible alternative procedures, arrive at a solution based on a systematic study of all relevant data, and carefully plan and prepare for the selected activities. In selecting educational innovations, it is proposed that the administrator collect all facts relevant to his situation which relate to the inputs and outputs of his educational system. On the basis of these facts an administrator can select an educational innovation which promises the most substantial improvements in areas of greatest need for his students.

In installing educational innovations the emphasis should be on advance planning and the active participation of all of those who will be involved in such a program, including staff, parents, and students as well as the administrative group.

In evaluating educational innovations, advance planning is again a key factor. Other points emphasized are the importance of a comprehensive rather than a partial evaluation and an evaluation focused on student learning and student behavior including long-range follow-up aspects.

In extending educational innovations the key factors are again systematic planning, scheduled decision-making at key points and special emphasis on the implications of the extension of the educational innovation.

In improving educational innovations the principal point stressed was the desire for evaluating defined classes of instructional methods and materials so that broad knowledge about why one instructional program is better than another will be obtained. Such a program makes continuous improvement possible.

In conclusion, this is a time of great opportunity for administrators. Their leadership in improving the quality of the American educational program is essential if our nation and the world are to survive and go forward.